

LODGE, OLIVER JOSEPH (*b.* Penkhull, Staffordshire, England, 12 June 1851; *d.* Lake, near Salisbury, England, 22 August 1940), *physics*.

Lodge was a member of an uncommonly vigorous and prolific clan. He was the eldest of nine children—eight sons and a daughter—of the merchant Oliver Lodge and grandson of the clergyman and schoolmaster Oliver Lodge, who had twenty-five children; his mother was Grace Heath, likewise descended from educators and clergymen. Lodge and his wife Mary Marshall had twelve children, ten of whom survived them; the youngest son, Raymond, was killed in World War I.

Lodge was educated privately until he was fourteen and then entered the business of his father, who was a supplier of materials used in the pottery industry. His interest in science was periodically sparked by visits to London, where he heard John Tyndall and

others lecture at the Royal Institution. He resumed his education at the age of twenty-two at the Royal College of Science and at University College in London, where for a time he served as a demonstrator in physics for George Carey Foster. He received the D.Sc. in 1877 and began publishing papers on electricity, mechanics, and allied topics. In 1881 he became the first professor of physics at the new University College in Liverpool, where he remained for nineteen years. It was during those years that he made his principal contributions, mainly in two areas: theory of the ether and electromagnetic propagation.

The nineteenth-century concept of the ether left numerous questions unresolved, one of which was whether the ether in the vicinity of moving matter moved along with it. The Michelson-Morley experiment of 1887 was thought to have answered the question in the affirmative. But in 1893—by an ingenious experiment involving the interference between two opposing light rays traveling around the space between a pair of rapidly rotating parallel steel disks—Lodge showed that the ether was *not* carried along. The apparent contradiction helped to discredit the theory of the ether and to set the stage for the theory of relativity.

Lodge is also remembered for his experiments on electromagnetic radiation, in which he came close to anticipating Heinrich Hertz's discovery of propagating waves, and for his participation in the beginnings of radiotelegraphy. Lodge's 1887–1888 discovery that oscillations associated with the discharge of a Leyden jar result in waves and standing waves along conducting wires, with measurable wavelengths and other characteristics predicted by Maxwell's theory, was overshadowed by the more spectacular results that Hertz obtained in free space in the same year. Lodge's interest in these phenomena extended to improved methods of detecting electromagnetic waves, in one of which he utilized the observation that electromagnetic irradiation of loosely connected metals makes them stick together. This principle, simultaneously observed and elaborated by others, formed the basis for an early detector of radio waves, a container of loose metal particles subjected to mechanical vibration (so as continually to restore the original conductivity) that he named the coherer.

On 1 June 1894, in a lecture to commemorate the untimely death of Hertz five months earlier, Lodge spoke at the Royal Institution on "The Work of Hertz," stressing the experimental aspects of the work, including the importance of "syntony" (resonant tuning) in obtaining good results. The lecture was published and subsequently incorporated in a book;

it had a widespread influence on the development of radiotelegraphy, inspiring experimenters in Germany, Italy, Russia, and other countries. With an associate, Alexander Muirhead, Lodge formed a syndicate to exploit one of his ideas, the resonant antenna circuit, and obtained some important patents.

In 1900 the University of Birmingham became the first British civic institution to receive a charter as a full-fledged university, and Lodge was appointed its first principal. He held the post until 1919, devoting himself increasingly to administrative work and the leadership of professional societies. He was president of the Physical Society in 1900 and of the British Association for the Advancement of Science in 1913. He received many prizes and honors, including the Rumford Medal of the Royal Society (1898) and the Faraday Medal of the Institution of Electrical Engineers (1932). He was knighted in 1902.

Beginning in 1883, Lodge also became interested in psychic research—telepathy, telekinesis, and communication with the dead—an interest that was intensified after his son's death and his own retirement in 1919. On two occasions he served as president of the Society for Psychical Research. He lived to the age of eighty-nine.

BIBLIOGRAPHY

I. ORIGINAL WORKS. Lodge's Royal Institution lecture was published in *Electrician*, **33** (1894), 153 ff., and reprinted by that journal with addenda as *The Work of Hertz and His Successors* (London, 1894, 1898); the third and fourth eds., retitled *Signalling Through Space Without Wires* (London, 1900, 1908), also contained reprints of several other papers and various correspondence. Among his other books were texts and more popular works, all published in London: *The Ether of Space* (1909), *Talks About Wireless* (1925), *Advancing Science* (1931), and *My Philosophy* (1933), as well as a work on psychical research, *Raymond: Or Life and Death* (1916). He also wrote an autobiography, *Past Years* (London, 1931).

II. SECONDARY LITERATURE. J. A. Hill compiled and annotated *Letters From Sir Oliver Lodge* (London, 1932); and Theodore Besterman assembled *A Bibliography of Sir Oliver Lodge* (London, 1935). There is an entry by Allan Ferguson in the 1931–1940 supp. to *Dictionary of National Biography*, pp. 541–543; and there are obituaries in *Obituary Notices of Fellows of the Royal Society*, **3** (1941), 551–574; *Proceedings of the Physical Society*, **53** (1941), 54–65; and *The Times* (23 Aug. 1940), p. 7. A well-documented chronological account of Lodge's contributions to tuned radiotelegraphy was prepared in support of his petition for extension of his patent by S. P. Thompson, *Notes on Sir Oliver Lodge's Patent for Wireless Telegraphy* (London, 1911).

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